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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/509,501 | 09/28/2004 | Eric Hanse | 1396 US/PCT | 4020 |
| 7590 | 12/12/2006 | | EXAMINER | |
| Robert S Klemz Jr Vesuvius 4604 Campbells Run Road Pittsburgh, PA 15205 | | | LIN, ING HOUR | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1725 | |

DATE MAILED: 12/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/509,501 | HANSE ET AL. | |
| | Examiner | Art Unit | |
| | Ing-Hour Lin | 1725 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 02 October 2006.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s)10-17 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s)10-17 and 19-21 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 10-17 and 19-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Rancoule.

Rancoule (col. 2, lines 37+) teaches the claimed pouring shroud (pouring nozzle) for casting a liquid metal such as a molten steel, comprising a base body made of a refractory material such as graphitized alumina having interior bore surface coated by dipping the pouring shroud (pouring nozzle) into a slurry to obtain an insulative coating layer having thickness of 1 to 6 mm. After an appropriate drying time, fourteen coated pouring shrouds (pouring nozzles) are subjected to a cold casting start-up (no preheat) and all survive with no indication of damage due to thermal shock. There is no observable build-up of frozen metal within the internal diameter of any of these fourteen test pieces. No external oxidation of the carbon in the alumina graphite nozzle body is evident in any of the test pieces such that the insulative coating layer also serves as a gas impermeable layer at the metal liquid contact during the cold casting start-up (no preheat), wherein the coating is prepared as a slurry and slip comprising (by weight %) (a) fused silica grain (30-85%) including vitreous and atomized grains obtained by an atomized process; (b) ceramic fibers such as alumina-silica fiber (0-10%), which can be substituted by insulating hollow micro-sphere such as commercially available alumina bubbles and zirconia bubbles for the purpose of improving strength of the green coating and thermal and impermeable insulation due to the trapped air spaces contained within their hollow shells; (c) frits (0-40%) for forming glass phase and enhancing air or oxygen impermeability through the coating; and (d) water (15-30%).

Regarding claim 16, Rancoule fails to teach the use of interpenetration between the coating layer and the refractory material of the base body. However, the use of penetration

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would have been obvious to one having ordinary skill in the art in order to improve the adhesion or bonding interlocking between the coating layer and the refractory material of the base body.

5. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rancoule in view of Muroi et al and further in view of Brandy.

Rancoule fails to teach the coating step including the use of drying the slip at room temperature for at least two hours. However, Muroi et al (col. 3, lines 2+) teach the use of removing crystal water in coating composition including roseki for the purpose of preventing crack of coated casting nozzle caused by water vapor expanded by molten metal if any residual crystal water was left. Brandy (col. 2, lines 2+) teaches the use drying the slip at room temperature for at least two hours, for the purpose of drying slip water in the insulating coating material including 5-40 wt % insulating hollow microspheres of silica and alumina so that no water was left in the coated layer. It would have been obvious to one having ordinary skill in the art to provide Rancoule the use of drying the slip at room temperature for at least two hours as taught by Muroi et al and Brandy in order to effectively remove the slip water and prevent coating layer and nozzle cracking caused by water vapor expanded by molten metal if any residual slip water was left in the microspheres.

Response to Arguments

6. Applicant's arguments with respect to claims 10-17 and 19-21 and an affidavit filed on 10/2/06 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ing-Hour Lin whose telephone number is (571) 272-1180. The examiner can normally be reached on M-F (9:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

fhd

I.-H. Lin

12/08/06

KEVIN KERNIS Kevin Kerns 12/8/06
PRIMARY EXAMINER